Reverse Redistribution in Myocardial Perfusion Imaging: Revisited with 64-slice MDCT

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Abstract The authors report myocardial perfusion imaging of a patient showing reverse redistribution (RR) and a 64-slice multidetector-row computed tomography (MDCT) with corresponding findings. The patient had subendocardial myocardial infarction (MI) with positive electrocardiogram (EKG) findings and elevated levels of cardiac isoenzymes. Experiencing this case emphasizes the importance of complementary correlation of a new diagnostic modality that helps us to understand the nature of RR.

Keywords Reverse redistribution · Myocardial perfusion imaging · 64-slice multidetector-row CT · Subendocardial MI

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Fig. 1 The patient was a 49-year-old man with a 1-year history of diabetes mellitus and hypertension, who was admitted with chest pain and ventricular fibrillation to rule out an acute myocardial infarction (MI). CK-MB and troponin were abnormally elevated. The electrocardiogram (EKG) after DC cardioversion shows prominent ST elevation in leads II, III, aVF, and V₅₋₆, findings suggestive for subendocardial MI in the inferior wall. A coronary angiogram showed a total occlusion of the distal left circumflex artery (LCX). A follow-up EKG showed no Q-wave

Fig. 2 Myocardial perfusion imaging shows a large moderate perfusion defect in the mid-to-basal inferior and inferolateral regions on the rest images, which, on the later 24-h delayed images, increases in extent and severity of the defect to be absent in some areas (*arrow*). This is a reverse redistribution (RR). RR was defined as the

appearance of a defect on the redistribution image in a region with normal or near-normal initial uptake of thallium in myocardial perfusion imaging [1–4], and subendocardial MI is one of the explanations for the RR. A study of RR observed with Tc99m-tetrofosmin was recently published in this journal [5]

Fig. 3 Sixty-four-slice multidetector-row computed tomography (MDCT) short-axis views of the middle left ventricle show a perfusion defect (*arrows*) at early phase (20–40 s after contrast injection) and delayed enhancement (*arrowheads*) at late phase (after 5 min after contrast-injection) in the subendocardial area of the inferior and inferolateral segments. These findings are suggestive of subendocardial MI

Fig. 4 Sixty-four-slice MDCT short-axis views of the middle left ventricle at the end-diastolic phase (**a**) and end-systolic phase (**b**) show decreased end-diastolic wall thickness (*arrows*) and decreased systolic wall thickening (*arrowheads*). Visualization of the non-transmural involvement became more feasible due to high spatial

and temporal resolution by the advent of a new diagnostic modality, multiple-slice MDCT [6]. Complementary correlation with other diagnostic modalities, for instance, 64-slice MDCT in this case helps us to understand the nature of RR [7]

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